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much fainter and shorter than the eastern, which was proved by its becoming invisible on raising the power from 110 to 450, the eastern arm remaining visible under the latter power. At 16^h 40^m the arms were judged to be equal in length and brightness, and both visible with power 450. At 17^h 15^m and until 18^h 0^m the western arm was decidedly the brightest.

Jan. 11th, 14^h 0^m. The edge of the ring again well seen, and the faint light before referred to unmistakeably visible.

Jan. 18th, 13^h 30^m. The edge of the ring broken, and the arms equal in brightness and length; faint light again clearly perceived near the planet's margin.

Shortly after these observations the instrument was sent to Archdeacon Garbett, of Clayton, in Sussex; and on the 19th of May, at 10^h 30^m, that gentleman and his sons clearly perceived the whole of the edge of the ring of *Saturn.*

The fine thread of light seemed to me always of a bluish-white tinge, very different in colour to the ball of the planet. The inner satellites were frequently perceived moving along the fine line of light; *Mimas* distinctly on two occasions.

1 Clifton Villas, Highgate Hill,
Upper Holloway.

On the Observations of Saturn made at Pulkowa and Greenwich. By the Astronomer Royal.

A paper has lately been received from M. Otto Struve, dated 1862, July 2, containing numerous details on the appearances presented by *Saturn* about the time of disappearance of his ring in May of that year.

It is not my intention here to transcribe the whole of M. Struve's observations. I shall only remark that M. Struve considers himself justified, by the views which he as well as M. Winnecke obtained with the Pulkowa Refractor, in assuming the existence of certain appendages (*appendices lumineux*) which are not the same as the ansæ of the ring.

No such idea suggested itself to the observers with the Greenwich Equatoreal.

I have requested Mr. Carpenter to draw up an account of his observations, and I ask leave to place them before the Society in juxtaposition with extracts from the remarks of M. Otto Struve. On the whole the accordance is good.

It will be remembered that "left" in Mr. Carpenter's language corresponds to "preceding" in M. Otto Struve's.

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J. C.

1862. May 5.

Right ansa longer by $\frac{1}{10}$ than the left.

May 13.

Ring of a dirty copper colour.

(A drawing was made.)

May 17.

The ring beyond the planet at times just visible on the left of the disk, but on the right only a small faint spot could be seen in the plane of the ring, about $\frac{1}{3}$ the diameter of the disk from the planet's limb. I should have suspected this was a satellite but for its elongated shape.

Sky very hazy.

STRUVE.

1862. May 15.

The line of ansæ perfectly well visible. On the north side it is more glittering, and limited by a sharp edge. On the south side, on the contrary, it appears as if clouds of a less intense light were lying on the ansæ.

On the body of the planet the obscure ring is visible, but I cannot see traces of the above-mentioned clouds.

Measures of Ansæ.

Preceding, $11''\cdot07$;
following, $10''\cdot35$.

May 16.

Preceding ansa without doubt longer than following ansa in the proportion of 5 to 4.

May 17, 15^h.

The preceding ansa estimated to extend $11''\cdot4$, or at most $13''\cdot3$ beyond the planet.

The light of the preceding ansa is of the colour of rose copper, and considerably stronger on the side touching the planet.

(Computed time for disappearance of ring, May 17^d 19^h.)

May 19.

Saturn very well seen. The ring distinctly visible on the left of the disk; and fairly, but not so distinctly visible on the right. Where it crosses the disk the under edge is much sharper and better defined than the upper edge.

(A drawing was made.)

May 18.

I see the ansæ distinctly; they offer the same appearance as yesterday.

May 19.

I see distinctly traces of the ring, especially on the preceding side.

The luminous appendages extend on the preceding side to 0·6, and on the following side to 0·3 of the diameter of the planet.

Their colour differs much from the ordinary colour of the ring. They are not yellow, but more of a livid colour, brown, and blue.

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May 20.

Saturn very well seen; the ring distinctly visible, appearing brighter than it did last night.

(The drawing made last night may be considered as a fair representation of the planet's present appearance.)

May 25.

The ring still just visible.

June 1.

The ring still visible during moments of good definition.

June 3.

Saturn well seen. The ring very plainly visible. During moments of very good definition I fancy I can see the flat surface of the ring very faintly illuminated.

December 22, 1862.

May 20.

The aspect of the luminous appendages has not varied since last night, with this difference only—that I estimated the length of the preceding side as 0·65, and the following as 0·5 of the planet's diameter.

May 21.

Images good.

Estimated extent of luminous appendages:—Preceding side 0·6, following side 0·4, of the planet's diameter; also the intensity of the light appears much more feeble on the following side. The size of these appendages increased in the neighbourhood of the planet, giving them the form of sharp wedges.

May 22.

Images less favourable than yesterday. Extent of luminous appendages on preceding side 0·6, on following side 0·5 of the planet's diameter.

June 3.

Image very bad, yet the luminous appendages are still distinctly visible. It appears that the length of the following ansa is a little the greater, but this is not certain.

Mr. Joynson communicated to the Society a series of thirty-six drawings of *Mars*, taken at Waterloo, near Liverpool, Lat. 53° 28′ 24″ N., Long. 3° 1′ 44″ W., accompanied with the following explanation:—

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The diagrams are selected from a considerable number of drawings of the planet *Mars*, about the time of his opposition, and extend from the 25th of Sept. to the 10th of Nov., 1862. They were taken with a lens of 3½ inches aperture, and a power of 370, both lens and eye-piece being made by Messrs. J. Cooke and Sons, of York. They are arranged so as to show the appearance of the planet during the whole time of its rotation, and a few are repeated so as to show that the aspect of the planet was not changed during the time the observations were continued.

The results of the observations appear to be,—

1st. That the band is continuous round the planet, with the exception of the place where the pale yellow stripe crosses it, as marked in the diagram of 5 October.

2nd. That the snow at the south pole is not exactly on the axis of rotation.

3rd. That the time of rotation is $24^h\ 37^m\ 49^s$.

No opinion is offered as to the permanency or otherwise of the band, but it is found that the disk continues (Nov. 1862) to show the appearances that it did at first, so that there is no difficulty in knowing what part has passed and what has to be seen later in the night.

The general colour of the planet (beside the band) was yellow, save a part in the northern hemisphere, seen between the 12th and 24th October, which was reddish. Sometimes the band had a dead greenish cast, and sometimes it was of a purplish line, but in the main it was very dark. On the 26th October the opening from it appeared to extend very nearly to the snow at the south pole, and then to form a darkish semicircle about it.

It may be remarked, that in general the northern hemisphere to the northern edge of the band has been the best to define, whereas the southern hemisphere has mostly been rather indistinct, and the yellow colour less perceptible than in the northern. The small circle on each diagram marks the position of the snow.

The planet has now become gibbous, and is both smaller and worse to define with the same eye-piece than when the observations were commenced.

The telescope is equatoreally mounted, and was driven by clockwork during the observations.

The eye-piece was the ordinary Astronomical Inverting kind.

Liverpool, 18th Nov. 1862.
